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This paper discusses mental operations and considers data acquisition as necessarily a reduction of the data of the external field. Internally the reduced data is recognized in the mask field which generates signals for the homeostat which then determines the availability of recognition units called masks. The homeostat permits mask operation which perpetuates the situation of the homeostat.

A MODEL OF MENTAL PROCESS

by

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APPROVAL PAGE

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CHAPTER I

INTRODUCTION

This paper will discuss the mind of man. Mind suggests mental processes and not physical parts, while man signifies an individual within the human species. Specifically, I intend to introduce new words and systems to encourage discussion of mental processes in language other than that which is currently used. The weakness of this paper may lie in the very breadth of its scope and in its attempt to synthesize a great deal of information. This paper is a beginning. It is the first sketch, in words, of my ideas. It is a brief presentation of my ideas, which are still incomplete, and a restatement of ideas of others. I have taken the liberty of restating these ideas within the structure of my model of the man's mind.

Ideas presented in this paper may be difficult to grasp. The very limits of language as I use it in mental processes may hinder complete description of those processes. Language enables man to proceed reasonably, but it limits mental operations to straight lines and allows only one channel of process at any one time. Alan Watts suggests that while straight lines of language are simpler, squiggles are more accurate representations of the natural world. [1] So the

straightforwardness of language should not mislead the reader from the complexity of his mental process.

CHAPTER II

AN OVERVIEW

To begin this paper one must consider the astronomical universe. Man resides on one planet among several rotating around a rather ordinary star near the edge of the milky way galaxy. The physical dimensions of any individual man when viewed from the reference of the universe are so small as to be insignificant. While Man has recently been able to affect the planet Earth, his effects beyond his own solar system consist only of electromagnetic radiation and some recent small radio probe devices.

Data Classification

Man has experiences with the data of the universe far in excess of his ability to affect the universe. Data available for experience are limited by the receptor organs of the human body. The ability of Man to experience data differs from other species of animals. For example, photoreceptor structures of insects and crustaceans distinguish angular polarization of light while acoustic sense organs in bats and other lower animals are sensitive to frequencies of "sound" too high for the human ear.[2] Since Man is unable to experience all of the data of the universe or even all of the data of the planet Earth, I

will use data in this paper only in the context of that which can be experienced by the mind. Data will have two major classifications: External data, or data originating on the outer side of the surface or skin of man; and internal data, or data originating within the body of man. Problems quickly develop in classifying data; the solution of these problems is one of the themes of this paper.

Projection Field

The projection field will be the first process to be considered. In order to do this it will be necessary to define the term "field." Field is used here as meaning the background or arena in which a process occurs. The field is not the process, and since mental process is singular only in the sense of being one of many possibilities, the word "field" will mean the arena which contains all of the possibilities of a particular process. The number of events possible within any field is so large as to prevent description of all possible events occurring within a field. The projection field displays data in patterns which can be processed by the mask field which will be introduced later. The source of the patterns within the projection field coincides with classifications of data as external and internal. External data enters the projection field only by being translated into neural signals by the sensory organs of the body. Internal data comes primarily from within body tissues but more frequently and more significantly from other mental processes. There remains

some overlap of categorizing data sources in this construct; for example, ear pain resulting from a change in air pressure. Such pain originates from an external pressure change but it exists within the body in the sense of the specific nerve endings which created the distress signal. For the purpose of this paper, such ear pain will be classed as internal data as it did not result from the stimulation of any specific sensory organ. The predominate internal data source has its origins in other mental processes such as memory, dreams, the mask field, etc.

Mask Field

The mask field is made up of bifunctional masks. The two functions are recognition of data and creation of homeostatic signals. Recognition of data will be discussed first. In the beginning data is experienced amorphously, it is without form.[3] Form is imposed on the data by the process of creating masks. In the mask creation process the recognition elements of the object are created and recorded[4,5]. At the same time all data which is not of the event is eliminated.[6] The elimination of all data not of the event will be referred to as opaquing. After a specific mask has been created, it establishes an expectation of data and opaques data which is not used in fitting the event to the mask.

The fitting process is always assumed by the perceiver to be accurate. Ordinarily, once fit has occurred the data will not be experienced further, as the recognition elements of the mask now become the stimulus for any further processing or recording. A test for accuracy of any fit can be determined only after some interaction with the external data is attempted. Each successful interaction with the data will reinforce the mask, which can become quite inflexible after a period of time.

The workings of the mask process can be illustrated by observing some common items in our environment. When one sees a traffic sign, there is a moment when only the sign can be observed; all other data is excluded in the moment of recognition. The mask and the data fit and therefore opaque out other data being displayed in the projection field.

The driver's response to a traffic sign is the result of recognizing the sign. If a new sign is observed for which no mask exists, a mask may be created because of subsequent interaction with the data. The pictogram of a truck on a wedge means "hill - trucks use lower gear". A driver's first exposure to this sign without a pre-existing mask will be remembered only as a curiosity if it is remembered at all, unless the driver nearly loses control of his truck on the hill. After such an experience the driver would create a mask so that a recurrence of loss of control will be avoided.

Normal operations of the mask field require the pre-existence of some sort of pattern of recognition.

New masks can be created using our experience with external or internal data. External data does not affect the mask field if there are no sensors to receive and project the data. This handicap is rather obvious in the case of the blind individual. Also if there is no variety in the external data available then mask creation will also be limited. A man living in a location which does not provide a wide variety of external data develops a mask field with fewer masks than would be the case if he were living in a location with a greater variety of data. It is quite possible for two people living in very similar data worlds to have not only different quantities of masks but to also have masks relating to different data. One child may be able to classify dozens of airplanes while another may not be able to differentiate between any airplanes. Some of this difference results from chance, some from training, and some results from differences in the sensory organs.

The discrimination with which pitch of sound can be distinguished is a function of the number of hair cells in the cochlea and the length of the cochlea.[7] This physiological difference will also cause a corresponding difference in the potential number of masks which can distinguish pitch. The actual number will be affected by experience as well as morphology.

Parents may act to inhibit mask development by punishing children who attempt to develop masks with which the parent does not approve. A common example is restricting girls from physical contact sports and boys from kitchen activity. These restrictions thus act to restrict the formation of masks.

The action of chance in mask formation is difficult to describe. It may be a matter of convenience that a child prefers one toy or set of toys over another set of toys. A child may develop a preference for a toy or an activity for reasons which have no relationship to adult interpretation of the child's choice. When a boy plays with a GI Joe doll it may be a sign of aggression or it could be that the boy likes green cloth.

Masks are created which handle internal data just as they are created to handle external data. Modern scientific method allows one person who has private data to communicate the private data so that others may experience the private vision. This process of describing the event so that another person can re-create and experience the event enables data which was previously private to be accepted by another person and transforms it to "common" data.

Mask formation is both a function of and a test of one's mental ability. The college board and other proficiency exams test for mask formation. They can best be described as tests which the subject can answer correctly only because of experience with the specific data or

processes used for each question. Most tests of mental ability are tests of specific data or of processes, but creativity tests and artistic tests would be tests of mask generation both in terms of quantity and quality of the masks which will be formed. In constructing mental ability questions there should be specific questions for mask and memory, there should also be questions which will cause masks to be created.

The absence of masks may be due to environmental deprivation or it may be beyond the mental ability of a specific person to form masks. Those with structural brain abnormalities would be the most obvious examples of the failure of mask generation because of the absence of sufficient brain material.

The Homeostat

There is also a mental process which retards and sometimes specifically forbids mask generation. We call this process the homeostat which will in its attempt to continue a homeostatic situation, block mask generation which would alter the state of equilibrium of the homeostat. The term situation refers to the state or condition of the homeostat, at a particular moment of time, determined by a combination of the previous state or condition and the state or condition signals received from the mask field. The homeostat thus functions so as to prevent mask generation or operations which would dramatically alter the homeostatic condition. Actions of the homeostat will

make masks inoperative and thus prevent further reception of the homeostatic signals which might disrupt the homeostatic situation. Often we use "feeling states" such as "I feel loved" or "I feel rejected" or "I feel angry" to express the homeostatic situation. These expressions are very crude reductions of a complex homeostatic situation which expresses itself physiologically in pulse and respiration rates as well as hormone and enzyme levels.

The hypothalamus has been shown to regulate bodily temperature, water metabolism, appetite, etc.[8,9] Nigel Calder suggests that brain connections, not yet fully traced, permit the emotions to bias our perceptions or reality.[10] Animal experiments produce evidence that the hypothalamus has a determining influence upon feeling states subjectively experienced as pleasure, pain, anxiety, or sadness.[11] These citations are intended to show that researchers ascribe to the limbic symtem, of which the hypothalamus is the core, processes which I believe are homeostatic. In this paper, the term homeostat will be used because a precise location of these functions in the brain has not been shown and is of no consequence to this paper as it is restricted to a discussion of mental processes and not to an analysis of the structure of the brain.

Some illustrations of homeostatic process might prove helpful at this point. There are many masks which can fit (i.e., correspond to) the data. Consider a few examples: A female who is a mother,

a female who is a sister, a female who is a wife, a female who is accessible, a female who is inaccessible. A young man who sees a female has several possible mask fits. The "mother" mask may be highly specific or it may be similar to the "wife" on some significant recognition patterns. An "accessible female" and an "inaccessible female" have nearly identical recognition patterns so that upon observing a female a man's masks will begin to fit or "come into play" for accessible females and send homeostatic signals which are characterized by acceptance and comfort. If, however, the homeostatic situation is one of rejection and discomfort, these signals will begin to cause a change in the homeostatic situation. Since the essential function of the homeostat is to maintain its situation, the mask causing change will be inactivated. An "inaccessible" female has a recognition pattern similar to the accessible female so this mask begins a fit. Signals from the mask to the homeostat are those of rejection and discomfort and thus these signals will reinforce the current homeostatic situation. As the homeostatic situation continues the mask fit can be perfected.

One of the frequent problems of a marriage is that the mask for nagging mother and encouraging wife have similar recognition patterns but very different homeostatic signals. A husband with a homeostatic situation loaded with resentment may be unable to operate the mask for encouraging wife, as these signals would not act to reinforce the

homeostatic situation. Now the encouraging activity of the wife will be fitted into the mask of nagging mother and the resentment situation of the homeostat can be maintained.

It should be remembered that the action of the homeostat is to restrict mask fits so that fits will more frequently occur between projected data and those masks which will generate reinforcing homeostatic signals thus maintaining the homeostatic situation.

Returning to the learning operation, we find that mask generation will be inhibited whenever the generated mask might cause homeostatic signals which do not reinforce the homeostatic situation to be created. It is much simpler and more commonplace to find that masks will not be created if their creation will not reinforce the homeostatic situation. If masks are not generated to process some particular data, then that data cannot be processed. Those masks which do fit the data in any scene or sequence will act to prevent other masks from operating. This process is one we shall term "opaquing".

Homeostatic processes control mask field operations. The reader is reminded that there is no little man nor is there a ghost. The homeostat operates by some mechanism which averages the homeostatic signals from the mask. These signals are generated as fit occurs and while some signals are weak, others may be very strong. Signals which radically change the average will result in mask shutdown. Signals which are close to the average will not

disturb the averaging so that mask so "fit" can occur. The allowable variance from the average is a measure of homeostatic situational tolerance. If this tolerance for signal variance from the average is low, fewer masks will be permitted to function. If the situational tolerance is too high, the homeostatic situation will vary greatly over a very short period of time. This wide and rapid variance will be experienced as rapid mood changes such as those often observed in American adolescents.

Change in the homeostatic situation does occur but the criterion for allowing change is how much and how fast. If the situational tolerance is too narrow many masks will not be generated and of those which exist only those few which reinforce the homeostatic situation within the narrow situational tolerance will be permitted to function.

In the occurrence of what is commonly called taste one can observe the homeostat at work. Preferences of colors, sizes, textures, are a result of the homeostatic signals which masks generate. The mask field can process red or green, large or small, rough or smooth with equal effort. With each mask fit there will be a homeostatic signal. If this signal is in harmony with the homeostatic situation, that mask will operate. If the signal is not in harmony with the homeostatic situation and if the variance is too great, the mask will be shut down. Suppose one's mask for rough texture generates signals of comfort and security while smooth texture is

stimulating and adventurous. If the homeostatic situation is one of comfort and security then the smooth texture mask will not be allowed to function, as its signals are not in harmony with the homeostatic situation.

Memory Processes

The memory process functions by recording data. This process acts so as to conserve the amount of mental material committed to any recording. Projected data may be recorded directly by the memory process, but in order to conserve effort most memory recordings will be made from the processed data of the mask field.

Eidetic imagery will be described as projection field recording. While projected data is subject to analysis by the mask field, some projection field data are recorded directly. The best demonstration of such direct recording consists of generating two patterns of dots with the aid of a computer. Each of two pictures have no apparent pattern and contain 10,000 dots. The pattern appears only when the pictures are superimposed. There are subjects who have been able to superimpose the pairs of pictures by remembering the first picture and subsequently viewing the second picture.[12] Haber has tested for eidetic imagery in children and found that less than 5% of those tested have such an ability.[13] In further studies with these children he found that if a subject named the objects of a drawing the subject could no longer recall the image of those objects.[14] Thus

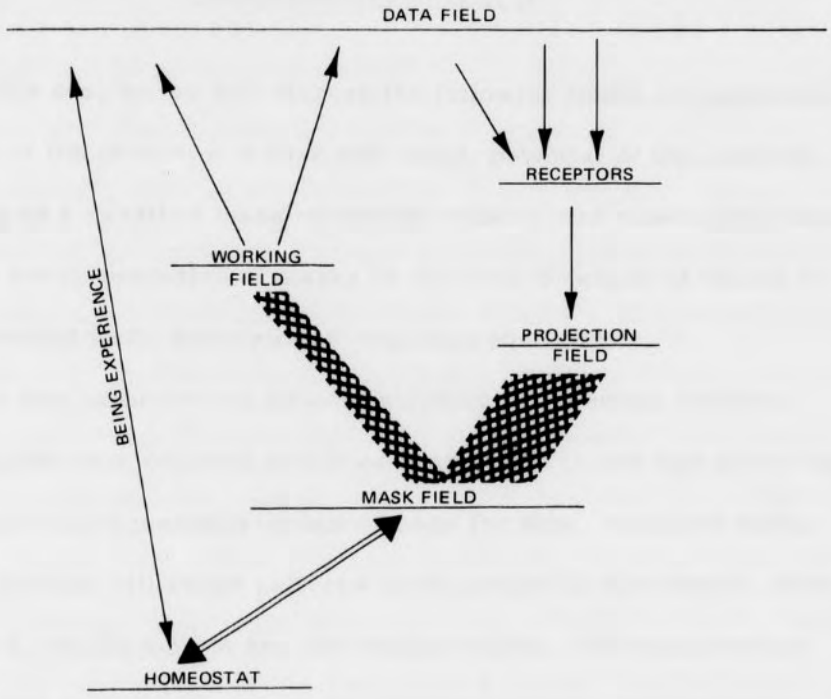
memory recordings from the mask field seem to interfere with recording of the same data from the projection field.

Memory recordings necessarily are not only of the data from the projection and mask fields but also are recordings of the masks themselves. Memory processes involve the other mental processes.

Penfield describes memory as: "One of the final stages in neuronal integration . . .". He views this as being formed by the selection and attention processes.[15] Since this paper separates the selection and attention processes of the mask field from memory, memory is seen as another process.

Fig. 1. An Aid to Relating the Processes

Use this chart only as a diagram to aid in learning the elements of this paper.



Memory Records from:
- Projection Field
- Mask Field
- Working Field
- Homeostat

Memory Plays to:
- Projection Field
- Mask Field
- Homeostat

CHAPTER III

LIMITS ON EXPERIENCE

In this chapter we will discuss the following limits on experience: position of the observer in time and space; potential of the sensors; opaquing as a result of mask operation; existence of masks preceding the data event; operation of masks in clusters; blockade of masks by the homeostat while attempting to maintain equilibrium.

Man has expanded his sensory abilities by ingenious devices. Photographs from orbiting satellites enable man to see that which was previously only a mentally-created image for him. Invisible radiations of X-rays will cause patterns to be created in film which, when developed, enable man to see into opaque solids. Microscopes are used so that very small objects can be visually enlarged for observation. Electrical circuits have been developed which make visual displays of "sound" at frequencies beyond the range of the ear. The data of these and other ingenious devices will be utilized by only a few people in our culture. Without these devices, however, there is still much more data around each man than he will experience.

Position in Data Field

Data cannot be experienced which does not arrive at the

observer's place in the world. Of the data which does arrive at the observer's place much is in a form that cannot be detected by the sensory organs. "Sound" and light at frequencies beyond the range of the sensory organs will remain unobserved unless some of the previously mentioned devices are utilized.

Data which arrives at the observer's place and is within his sensory capacity will be projected by the projection field process but it will not be experienced if there are no masks available. When masks are available the operation of masks is such that two or more cannot operate simultaneously. Each mask, as it functions, opaques out data surrounding that which is being fitted to itself. This opaquing process prevents the concurrent operation of more than a single mask within the field. Ventriloquists exploit this feature of the mask field by operating mannequins which move so as to have the observers mask fit with the motion of the mannequin's motion. As the mask field of the observer is fitting the movements of the mannequin the observer's mask field is unable to have mask fits on the ventriloquist's mouth and throat movements. Ventriloquists further exploit the mask field by avoiding lip and facial movements for which the observer already has masks. Masks utilized in recognizing the source of speech do so by observing facial movements and not throat movements.

Mask operation is singular in that only one mask will operate while others remain opaque to the data. This aspect of mask operation ensures that only one mask will be operating at any moment. Many masks may be testing the data but unless fit occurs a mask will not continue processing. The mask which is operating contains a representation of the data which corresponds to some aspects of the data. The fit may not conform completely but the lack of conformance will be of no consequence as the operating stimulus will no longer be the external data or the representation by the projection field of such data. The operating stimulus is the operating mask itself.

Opaquing

Opaquing data is not the result of a judgment about the data; it is a neutral act. It is as if there were many doors (represented by masks) for data to enter but each door is unique and admits only a specific piece of data. If a door opens (as when a mask fit occurs) all other doors are slammed shut automatically without regard for the data before any other door. It is significant that the data exclusion as a result of opaquing is performed without analysis by the perceiver. The exclusion of data by opaquing should not be construed as an act hostile to the data so excluded. Faster operation of the mask field will result in shorter opaquing periods and thus permit more data to be processed in a given period of time.

Masks which do not exist cannot process data. Later in the paper we will discuss mask generation. Data which is projected without any expectation by the mask field can only be processed as masks are generated. Mask generation is a slow evolutionary process, so that an experience of novel data will not always occur. There is occasionally some novel data which makes a sufficiently strong impression so that masks will be generated quickly.

Relationships of Masks

Mask clusters also act so as to prevent data from being processed. A cluster of masks consists of those masks used in a particular group of mental operations. Different clusters are used during different classes of mental operations. One such cluster is associated with driving a car, another cluster is associated with cooking, another cluster with walking down a street. It is the difference between clusters which accounts for some experiencing of the same data differently. A pedestrian crossing against the traffic light is cause for consternation when one is driving, but when walking it may be a very natural and convenient event. A not uncommon example of differing cluster functions occurs when a driver asks: "Turn left?" and the passenger replies: "Right." The driver is operating with the driving cluster where right is a direction, while the passenger is conveying the correctness of the situation. If the passenger is

operating from a driving cluster then a right turn is appropriate; if not, then a left turn is appropriate.

Results of personal interaction where different mask clusters are functioning have long been the stock of comedy skits. The difficulty of operating from different clusters is that it takes a longer period of time for appropriate mask operation. The appropriateness of mask function can be determined in retrospect only after the person has demonstrably responded into the external world. While the mask function may be diffused or delayed the eventual operation into the external world by the person will validate the mask fit.

Homeostatic Operations

The greatest experience is the inhibitory effect of the homeostat. Experience of the data within the projection field is not directly available to the homeostat. "Being experiences", which will be explained later, involve direct linkage of the homeostat to the projection field. Being experiences are not in the range of the usual operation of the homeostat and are sufficiently rare so that such an experience is often savored by the experiencer.

Secondary experience of the data within the projection field constantly occurs as the mask field operates. As a mask fits the data a homeostatic signal is generated by the mask, and since the mask pre-exists for the data (i.e., only a small mask accomodation to a

data event is possible within a unit of time), the homeostatic signal is also fixed to each mask by experience.

It is possible to have two or more masks which will fit the same data but each mask will have a different homeostatic signal and will affect a different response as the mask links will also differ in connecting to the motor response system.

The data event of one person complimenting another can be processed by either of two masks one which has a secondary signal of warmth as the recipient accepts the compliment as deserved and well intended. The other mask has secondary signals of hostility and regards the compliment as delivered only so as to manipulate the recipient. Both masks fit the data, but the secondary signal differs greatly. If both masks can equally fit the data then why do they not operate in a random manner? The answer is that the homeostat acts to defend the homeostatic situation against secondary mask signals which would upset the current equilibrium. Defensive action consists of shutting down the operation of a mask which would have resulted in a signal which differs too much from the homeostatic position.

The position of the homeostat can only be located in a multi-dimensional representation. The actual number of dimensions could be few but probably would be very large. If the number of dimensions could be reduced to two and if those dimensions were on a continuum of self-acceptance -- self-rejection and comfort -- irritation then

simple plotting on graphs would be possible. It is a dramatic over-simplification to consider only two axes, but for illustrating this paper such coordinates will be utilized (see Fig. 2).

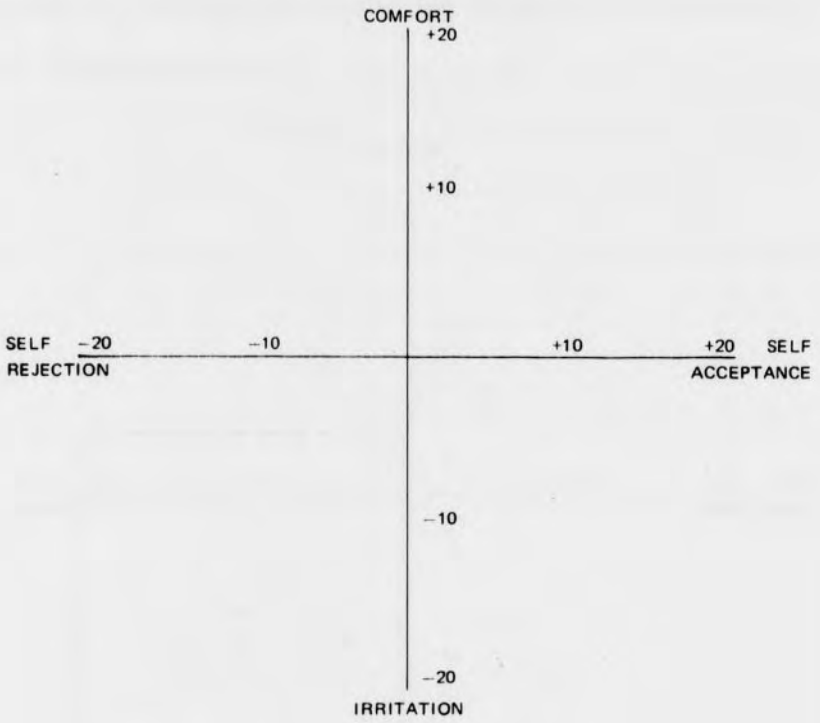


Fig. 2. The Homeostatic Grid

The homeostatic position is the result of the averaging of secondary mask signals received by the homeostat (see Fig. 3). Where each secondary signal is shown plotted with an "x" and the homeostatic position by an "o" located by averaging the position of the secondary signals. The broken line represents the normal variance boundary

within which this homeostat will allow masks to operate freely. Any masks generating signals which will plot within this boundary will be permitted to operate. The boundary around the homeostatic position may enlarge or contract, be regular (as shown) or irregular (eg. elliptical, rectangular, etc.).

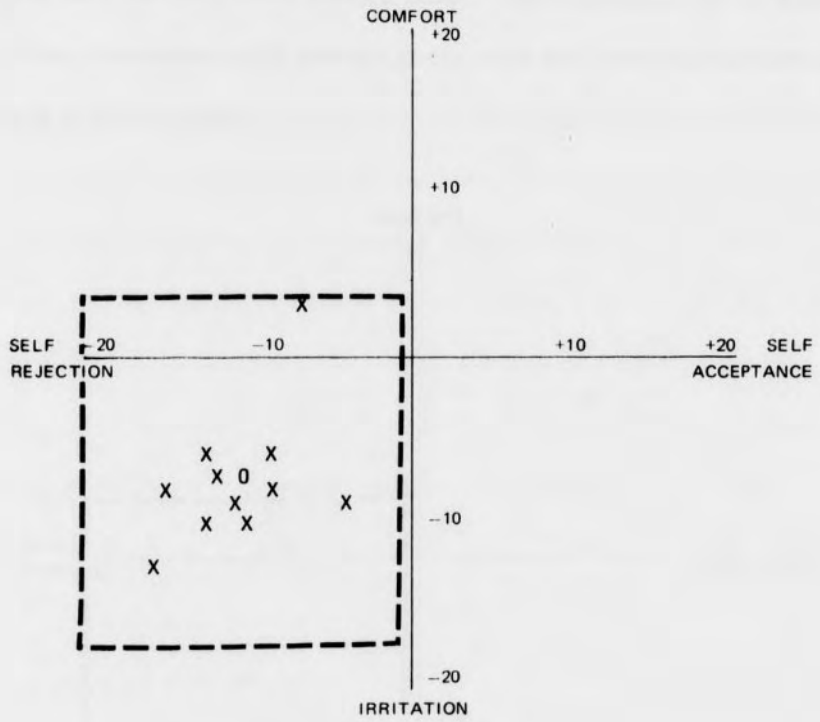


Fig. 3. The Grid Showing the Normal Variance Boundary

Let us consider the example of the complimentary remark. Let "A" represent the plot of the signal from the mask that accepts the compliment as well intended, while "B" will represent the plot of the mask which accepts the compliment with suspicions (see Fig. 4). Since "A" lies outside the variance boundary the mask which generates that signal will be shut down at this time. The signal at "B" is acceptable and the homeostat will not interfere with the operation of the mask generating such a signal.

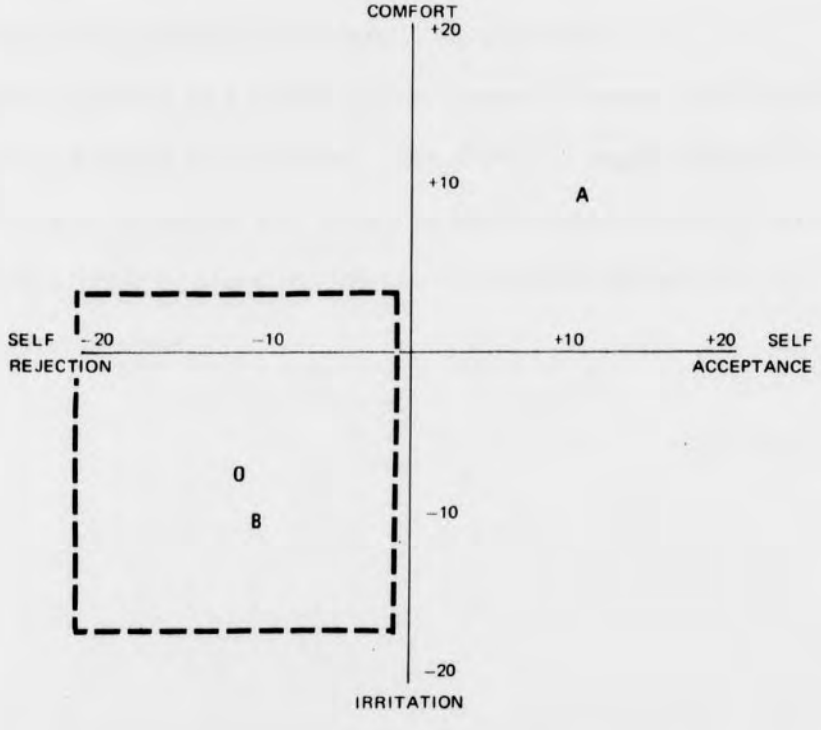


Fig. 4. The Grid Showing Acceptable and Unacceptable Signals

As a result of this selection example the perception of the compliment will be with suspicion of the giver's motives. The homeostatic position will be altered as this signal is averaged into the homeostatic position. This alteration is such that the possibility of allowing the operation of the mask generating signal "A" is further reduced.

There are two shorthand rules for the homeostat function: 1) As the distance from the homeostatic position increases the resistance to that mask operation also increases. 2) In maintaining equilibrium the homeostat will resist mask operation which generates signals requiring rapid change of homeostatic equilibrium.

Mask shutdown as a result of homeostatic blockage limits experience and is difficult to overcome. The effects of mask blockage by the homeostat are increased with stress as the variance boundary contracts and further reduces the number of masks which will be permitted to operate.

CHAPTER IV

EXPANSION OF EXPERIENCE

This paper will now turn from the limits of experience to consider how experience can be expanded. The first and easiest method is to simply move about. It seems obvious, but the experience available in one place without movement is less than would be possible with movement.

Previous discussion about sensory range expansion technology has pointed out that even with such technology expansion of the mask field occurred only for the few. The expansion of sensory range does create opportunities for increased experience.

One of the more common experience expansion techniques involves increasing the speed of the mask field. Since many of the masks operate on language stimulus, "speedreading" is a technique of speeding up the mask field operation. Speed here is used in the context of how many mask fits can be accomplished per period of time. If sixty fits are possible per second the field can handle more data than one which can only process twenty fits per second. As the field opaques with each fit and then opens in anticipation of the next fit it is desirable to have a greater amount of time with the field not opaqued because data will not be admitted during the opaque phase of field operation.

Mask Generation

Mask generation is required for any expansion of the limits on experience. Simple movement and expansion of sensor range only act to increase the potential number of masks. If the masks are not generated the change of place or sensors will be of no value.

Gregory, while discussing internal representations of external objects and events, does not use "mask" as the word to describe such a process. He does comment: " . . . perception is not directly of sensory information but rather of the internal models selected by sensory information. Indeed the current perception is the prevailing set of models."[16]

> Objects have all manner of vitally important properties which are seldom sensed, so current information cannot be adequate for dealing with objects. On this theory, perception allows behavior to be appropriate to the hidden properties of the objects, when the internal models sufficiently reflect their properties.[17]

Gregory writes of internal models with some clarity when he says that patterns are not sufficient to convey the meaning of objects and events. Meaning here is used in the context of the impact of the data upon the observer. For example, a snake facing the observer is threatening only because the observer's mask has information of the object which exceeds the sensory data.

Masks go beyond models in their operation in that they act to opaque out those other masks which might have operated upon the data.

Mask fits are based on best fit and meaning of the data.

Cassier writes of a symbolic system which he describes as a link between receptors and effector systems. He also discusses the cost man pays for such a symbolic system.

> . . . Man lives in a symbolic universe . . . No longer can Man confront reality immediately: he cannot see it, as it were, face to face. Physical reality seems to recede in proportion as Man's symbolic activity advances. . . . he (Man) cannot see or know anything except by interposition of this artificial medium. [18]

This artificial medium is the mask field which operates by fitting to external data but which is necessarily artificial; it is always more or less than the external data; once fit occurs the external data is no longer the stimulus. Stimulus now is that mask which fits and the data is reduced or expanded by the difference between the data and the mask.

Percy writes as the last link in my chain of writers. He has a concept which he calls the "Delta factor", which is a coupling effect whereby the object and the word for the object become coupled and may even merge into one. [19] This is important for the mask concept. Many masks involve coupling of words and sensory data so that the feel of a sphere, the spoken "ball", the sight of a shaded circle all are coupled by the mask "ball". This coupling is so strong that the class of sensory data (visual, tactile, aural, etc.) become of no importance. The mask fits ball and the mask field proceeds.

Many masks can be described in one or a few words but there are masks which have never been reduced to words. The phrase "reduced to words" is used here so that the reader may be reminded that the process of putting an idea into language so that communication is possible creates something less than the complete experience. As the data external to the mind have been reduced by the mask processes, so also will that data be reduced further by linguifaction (placing into language). In this paper language is not restricted to words, although it is more convenient to discuss language of words and symbols than bodily movements.

The most straightforward mask creation process involves language. Language is the means of transmitting masks to the learner. It is by means of language that masks are created so that the learner generates masks for many species of birds instead of only one mask for all birds. As more masks are generated the external world becomes less amorphous. Masks give form to the external data. The learner not only uses language in generating masks but he also uses language to test the masks which he has already generated. Mask testing is necessary so that each person will have masks which conform to those of other participants in his culture. For people of the southern United States the mask associated with dinner indicates eating at noon instead of during the later afternoon or evening of the day.

Language thus enables standardization of masks so that communication is possible.

Masks can be the same as a word and often, in the absence of experiential data, they will be the same. Language description or pictorial representation can lead one to an expectation of data which may be so strong that it will prevent experience of the actual event in any novel manner. Thus the initial experience of discovery cannot be recreated by those who observe the same events since novelty will not occur if the masks are already in existence. Novelty is an experience of previously unrecorded data being processed at the same time the masks for processing are being generated. There will be no novelty for those who have created expectations which closely correspond to the data.

Surely one of the disappointments of aging is the loss of novelty but such a loss while it is a by-product of learning is not necessarily complete. Serendipity should be encouraged so that novelty loss will not be so severe. Children do not have such a problem as their world is all new and experience has not yet been reduced uniformly to masks. The loss of novelty is most severe when a person lives in the same house on the same road with the same job and same companions. This sameness is a result of data being processed by masks which have not changed.

One should not despair, as much of what is experienced is necessarily the same and should not occupy all of our attention. It may not even be unfortunate for so much sameness to occur as a lower energy expenditure is required when processing this data than is required when processing novel data. The hazard to continued survival is that with each passing year it will become increasingly difficult to accept the anxiety which comes with changing data. As this anxiety generates resistance to mask change, adaptation to a changing environment will be resisted. It has been man's ability to adapt himself and his environment for his survival which has ensured his survival. It may indeed be more important for the good of society to teach serendipity than meditation so that novelty will continue to be experienced.

Homeostatic Change

Since mask field functions are limited by the homeostat it will be useful to examine the process of homeostatic change. Resistance to change is inherent in the attempts to maintain the homeostatic position. This resistance affects the operation of the mask field in that new masks will not be created nor will existing masks operate which will generate secondary signals that would cause the homeostatic position to change radically. The survival value of the homeostat is that it maintains each person against extreme variance in experience. This variance would divert Man's efforts to adapt to his environment. The limitation

imposed by the homeostat is that new experience will be permitted only when change in homeostatic position is not required.

To enable homeostatic position changes, new masks must be created which are not very different from current masks. The slight change in the homeostatic position may be exploited and more new masks created. Such mask change will be slow, but the person attempting change must coordinate both mask and homeostat changes. It is important for those attempting changes that they realize that the homeostatic position operates indirectly from the mask field but directly limits mask field operations.

Psychological counseling is usually directed at either establishing the homeostatic position or in changing the position. The principal technique used is to assist the client in linguifying the operation of the homeostat and thus enable the client and the counselor to treat the data as if they were of external origin. Any process which can be so linguified can then be treated as external data and thus subject to mask field operation. There is a pitfall in this technique in that unless new masks are created and the homeostatic position is changed, the client will be able to do no more than project the data to the projection field. This projection while satisfying one requirement of counseling does not permit change by the client and only allows endless travel around in a circle.

Since the processes of the mask field operate not upon the sensory stimuli but upon the projection of those stimuli it is necessary to determine not only what the data represent but also to determine the data source. There are two classes of data sources. Data of an external source constitutes that class of data which arises from events outside the bodily membrane and which is detected by specific sensory receptors. Some precision is necessary in this definition to avoid confusion. Pain in the ears which results from air pressure changes (as experienced in airplane flights) is similar to pain caused by the activity associated with a bacterial infection and is not too dissimilar to the pain caused by an extremely loud noise. In this paper only the pain of the loud noise will be considered to be of external origin, as it results from an alternation of higher and lower pressure waves - the phenomena associated with sound. Pressure changes in the ear which are not vibratory in nature will be classed as internal data because these changes, whether environmental or bacterial in origin, are not of the sort which are associated with sound.

Internal Data

Internal data will be considered to constitute the other class of data. As described above, any data which originates within the body will be classed as internal. Internal data includes but is not limited to the signals which result from the process of kinesthesis, dreams, imagination, and pain. The projection of signals arising from

kinesthesia and pain do not usually cause problems, as these signals always arise within the body. Internal data of imagination and dreams may cause difficulties, as it is usual to project data which the mask field will process as external data. Processing of internal and external data will be identical except that some mechanism exists which ordinarily acts to prevent confusion of internal and external data. It may be that the mechanism is chemical.

Dement writes that:

> . . . we were able to account for the heightened sense of reality in dreams by hypothesizing that the brain is doing in the REM (dreaming state ed.) state essentially the same thing it does in the waking state; a sensory input is being elaborated. In other words, the dream world is 'real' precisely because there is no detectable difference in brain activity.[20]

He also recounts experiments of Jouvet who caused inhibition of serotonin in cats and thus removed the barrier between REM sleep and wakefulness. "The PCPA treated (serotonin inhibitor ed.) cat would be described as a 'waking dreamer,' a description that has been applied also to the actively ill schizophrenic."[21]

Dreams, like hallucinations, are private data. Dreams occur in sleep while hallucinations occur in a wakeful state. Any attempt to communicate dreams so as to bring them into common data can only be accomplished by stopping the dream and communicating it in retrospect. Much of what is experienced in dreams is never recalled and

recollection is improved when dreamers are awakened during the episode.[22] In this paper dreams will be considered as ". . . spontaneous excitations that travel mainly to the brain's visual tracts . . ."[23] The interuterine life of a child may be completely devoted to REM; as the child is born and becomes an adult REM sleep declines to twenty-five percent of the total sleep time at age five.[24] This seems further to support the concept that spontaneous excitations are the source of dreams because the fetus has no visual images of the external world. The source of dreams will be considered as physiological while the content and continuity of dreams will be considered to be a product of mask field operations. Spontaneity of excitation will often prevent continuation of the dream and also be responsible for some of the bizarre events of dreams.

Dement comments: ". . . emotions may sometimes determine what we see rather than the other way around."[25] While he does not describe a process to account for such a determination, this paper has described such a process in discussing the homeostatic control of the mask field. Dreams can now be understood as spontaneous excitation during sleep, which as a result of mask field operations have recognizable forms and continuity. This private data event cannot be responded to or communicated as there is inhibition upon the motor response system of the body.[26] To remove this inhibition

the subject must be awakened and thus the dream is stopped so that any disclosure of events will be in retrospect.

Interpretation of dreams will probably remain difficult because sequences in dreams, while they may disclose patterns of the mask field, may also result from the randomness associated with a spontaneously generated signal. Dreams may originate solely in response to biochemical operations. This would seem to explain why a human fetus has a higher percentage of REM sleep than an adult. REM may also be only the period recovery from the sensory deprivation of deep sleep.[27]

If REM is the recovery from sensory deprivation it appears to lend support to the concept that the brain has an innate need for stimulation. In addition to their specific function, sensory stimuli have a general function of maintaining arousal of the cortex and if the brain is deprived of changing stimuli it will behave abnormally.[28]

Like dreams, hallucinations are private data but they occur during the waking state of the one who views the hallucinations. A hallucination, like a dream, is an event of the projection field; there is no corresponding external event which another person could observe. Attempts by another person to modify the hallucination will be resisted. Resistance to modifying a hallucination seems to be greater than the resistance to modifying external data. In handling external data one often modifies the data as a direct result of communicating with another person. Such modification is often observed in describing

colors as in labeling aqua a shade of blue or green. Viewers of hallucinations so resist modifying the images that such resistance can often be used in defining hallucinations. While the mask field operates with language and is influenced, if not determined by, language the projection field operates without regard to language. While language in the form of spoken or written words may be projected, the predominant data of this field is not of the language. Attempts to correct hallucinations with language will not be successful since the projection field while it displays language is not a product of language.

Like dreams and hallucinations, imagery may consist of detailed pictures displayed by the projection field. Images are private data which are never mistaken for external data. Images may be brief or extended in length but always they are recognized as private. Since they are recognized as private, attempts are rarely made to communicate them. Walter Mitty's imagery is one example of imagery. Architects, designers, writers, builders and most people have images. These images may be of buildings, electrical circuits, account ledgers, or loving.

In southern France pre-historic Man took his private images and drew them on the walls of caves. Perhaps the significance of these cave paintings is not religious. Surely these neolithic men were awe-struck when man first showed that a private image could be transferred onto the stone of the cave and thus transfer private data to the

external data field. Many of us can make private data external, but to be able to do so in a manner which enables others to accept the data is rare. Mere movement of the data from the private to the external world is no assurance that others will accept the data. Without acceptance of the data by others it will not be common. If only one man accepts and appreciates a particular external data event, that event will not become common until others accept the data. In order for the external event to be common others must accept the event and communicate their acceptance.

External Data (Private)

External data has two classes which derive from how man handles the data. If a single man observes the data it is of a class: external-private. If more than one man handles the data it becomes common. When only one person experiences the data it cannot be common. A single person observing flying saucers has not made the event common. When many people observe such an event it becomes common to those who have experienced such an event. A person outside of the group of observers has not experienced the data as common. Common data is that data which has been experienced by all who participate, and if one fails to participate it will not be common data for him.

External Data (Common)

Common means shared by all. Sharing will not occur precisely the same for each participant because there will be some difference in mask development. Sharing of data is possible only with language. Communication is possible by means other than language and while communication with some precision is possible without language, it is not possible to have the precision of complexity which language provides.

Language

Language is critical to the sharing of data because it enables similar masks to be created in all who participate. Language is a product of masks and masks are a product of language. As each participates in the event and uses language, masks will be formed which are similar. Each participant could participate without language but then the masks which develop would have less in common than those masks which develop with language.

For example, many people cross lawns, care for lawns, see grass and participate in this rather frequent data event. For most people lawns are of grass and some are greener than others. A grass specialist can recognize many species and varieties of grass. His recognition of diversity is common data for other grass specialists but is not common data for non-specialists. Anyone can have access to this specialized data and thus make it common by sharing a language experience of the data. Language ensures some commonality of the masks

which will be developed within the mask field of each participant. Experience with the data and the language of the data is possible whether it is written or spoken.

All language experience is not common and there is an element of the previous example which shows how some experience may not be common. If the non-specialist participates in the language experience of the specialist only as a recipient of the language he is "consenting" data to the specialist. Much of the academic learning experience is consenting language and thus the data to a specialist. Consenting language and so data to another is also common in children who consent data to their parents. Common data has an element of compromise which is missing in consented data. Educators in scientific fields have required laboratory work as a means of encouraging the creation of common data.

Science is more than logical construction and empirical observation. As the attention of science continues to expand into new fields there has been an increasing difficulty in definitions of science and the scientific method. These difficulties which concern method and theory will be downgraded if the reader will apply the concepts of private and external data. Science involves techniques of precision in description so that the private data of one person may be transmitted to another in order that the other can recreate the events of the first. If there is a common element in science it is that the private data of one can become

the common data of all. There is also the element of prediction which separates science from art. Art is private data displayed for others but without any attempt to predict the consequences and without the artist accepting the compromises which go along with common data. Science and art have made external their private data but a scientist must reconsider if the external data cannot become common while the artist will not reconsider since he has no expectation that private data should be common.

Mental processes deal with data which has been reduced by the sensory systems and compared within the mask field so that the data changes from its original state to the expectation of the masks. Mask field processes do not differentiate data by sources so that internal and external data will receive the same analysis. Only the inhibition of the muscular system which accompanies sleep prevents actions in response to dreams. When the muscular system is no longer inhibited in the waking state, the problem of sorting internal and external data may enlarge. Even when one is confident that data is external no one person can be assured that the data is external. There is only assurance that the data is external if other people participate in the event and if the participants communicate to each other their observations. Language is most commonly used for such communication. One of the most essential functions of language is to enable speakers and listeners to sort out internal and external data.

At a very early age a child, by touching himself and that which is not himself, learns the boundaries of his body. Later by conditioning, the child learns the boundary between his waking fantasy and external data. Children who wish to share their fantasy or daydreams with parents may not always be rewarded for this sharing. In some families severe punishment may result. It is by the action of adults that the child learns the boundary of internal data. The internal data boundary can be summed up thus: Internal data which one experiences while others are present will, if acted upon, receive a negative reward such as indifference, rejection or repression. Internal data can be so suppressed that endeavors to communicate it will be repressed even in a therapeutic climate. Procedures for extinguishing behavor in response to internal data are subtle but usually effective, so that by age ten to fourteen a child rarely acts out his internal data.

Language learning is from Chomsky a result of a deep structure of the mind which could be described as universal grammar. This deep structure is innate and while the surface form of language differs between languages these skills are too unique and difficult to have developed in Man as a result of the unique experience of each Man.[29] Also there is ". . . little useful analogy between the schema of universal grammar that we must, I believe assign to the mind as an innate character, and any other known system of mental organization."[30]

Whorf comments: ". . . grammar . . . is itself the shaper of ideas. The program and guide for the individuals' mental activity."[31] Whorf would also carry the grammar structure further ". . . by the word 'meaning'. Meaning will be found to be intimately connected with the linguistic: Its principle is symbolism, but language is the great symbolism from which other symbolisms take their cue."[32]

Gregory in attempting to answer the evolutionary question of what constitutes the deep structure postulates that: "We may suppose that Chomsky's deep structure did not originally serve language; but rather something else - developed millions of years ago to serve some other end."[33] Gregory continues:

> . . . the perceptual system makes sense of patterns never previously encountered. We can recognize objects from strange points of view and can deal with unfamiliar objects fairly well . . . Much as we read meaning from a printed page in terms of our previous experience of the world, so we read from retinal images the external world of objects and events. . . . What I am suggesting is that Chomsky's deep structure of language has its roots in the brain's rules for ordering retinal patterns in terms of objects.[34]

It may well be necessary to adopt Gregory's ideas if man is able to teach language to other primates in the coming years. Man has searched for a dividing criterium to separate himself from other animals and if he is able to teach primates language, the notion that language is an innate ability peculiar to man will be discarded.

The crucial element of experience which links masks and language occurs when, in the mask field of the learner, a bond is formed between the word and the object. When the word for ball and the mask for ball (a physical object) become bound it becomes possible to treat the word and the mask in a similar manner. It may even be preferable to use the word ball than to describe the mask which contains the representation of the object ball as less effort will be expended.

Naming

Objects and their names are projected within the mask field and masks are formed which link words to objects or words to constructs. After these masks are formed the mask fitting can occur with equal ease on the word or the object. Highly verbal people will be able to process words easier than objects or constructs. Masks which correspond to ball (written), ball (visual object), ball (sound), and ball (tactile object) will become so linked as to be treated as one mask. Mental processes do not for example separate the four aspects of ball described above. All four aspects of the object can be treated similarly. There will be differences in how one responds to "ball" but these differences will be in motor output and not in mental input.

Naming creates discreteness in an otherwise amorphous data world. To a child birds are anything that flies and even airplanes may be called birds. As the naming process continues the data becomes ever more discrete as red birds are cardinals but so are robins, until discreteness

is further developed so that red breasted birds become robins. Without naming, these discrete groups would be only members of a much larger class of objects that fly.

Without language, discreteness is slow to develop, as each person must re-create discreteness without being able to utilize the experience of others. With language masks can be formed without direct experience with the object. Early childhood is important because words and grammar are best learned at an early age and because masks created by words will retain many of the qualities present when they were created. If a child learns father (word) and experiences father (object) who abuses the child then father (word) will carry the qualities of child abuse. When this child becomes a father his actions will have qualities of child abuse because the mask retains those qualities. It is possible for the mask to change but it takes a great amount of effort or much experience for a mask to lose qualities associated with its creation.

Language enables similar masks to be created by each person. Each participant in a language is required to have some similarity of masks so that language is possible. In sharing language and data the uniqueness of the mask developed by a person for the object will be compromised by the language experience so that commonality will be created. Language alone enables one to make common that which originally was private.

Reflection

Language is also part of the process de Chardin refers to as reflection.

> . . . reflection is as the word indicates, the power acquired by the consciousness to turn in upon itself, to take possession of itself as an object endowed with its own particular consistence and value: No longer merely to know oneself: no longer merely to know, but to know that one knows.[35]

By means of language reflection is possible by linguifying oneself and displaying in the projection field the product in language so that one can treat the self as if it were external data. Psychologists and counselors teach their clients to project themselves so that reflection is possible. Reflection alone will not generate new masks or homeostatic positions but it is a first step toward that goal. New masks and new homeostatic positions are created as a result of reflection when combined with a motivation to change. It is not sufficient to assume that reflection is a process which will occur to all people. Some will never develop language skills and others will never be motivated to learn the technique.

Potential reality is all that is displayed within the projection field. Reality becomes that part of potential data which can fit to the mask field. Now the question becomes: What data is private (available to the experiencer only) and what data is common (shared by one or more)? All internal data is private; external data potentially is

common. As man exists as a social animal most of his behavior must conform to the common data of his social group or else he will be rejected. Language is the means of determining which data is private and which is common. A further requirement is that the language be communicated to another so that both can share the language as well as the data.

Reality

Reality can be expanded and private data can be made common. This paper attempts to make private data common but it will not be so effective as a document which describes data testing so that others may experience this data for themselves. Many of man's advances in knowledge result from the private data of one man being accepted as common data for many. It is not necessary that all accept the data for it to be common. The theory of evolution of man is an example of this.

Expansion of potential reality can be accomplished by motor responses. Movement of the body so as to change the view will expand the potential reality. Reality will usually change with the movement but as the tourist travels he may not see anything except that which he was expecting. The expectations of the mask field do control reality and if an expansion of reality is of value Man should be encouraged to be alert to fortunate and unexpected discoveries.

A serendipiter will have a larger pool of reality experience than will the person who is not alert to the unexpected. Serendipity may be as valuable or more valuable than any course now offered in schools.

CHAPTER V

THE 'BEING' EXPERIENCE

> The life of a human being does not exist merely in the sphere of goal directed verbs. It does not consist merely of activities that have something for their object.
> I perceive something. I feel something. I imagine something. I sense something. I think something. The life of a human being does not consist merely of all this and its like.[36]

Buber has written of the limits of becoming too engrossed with the specific mental processes. That which Buber touches on above he refers to as the realm of the "It" and this paper refers to the realm of the mask field.

Mask field operations in this paper are a function of expectations founded upon experience. Buber comments: "The I-It has only a past and no present. In other words: insofar as a human being makes do with the things that he experiences and uses, he lives in the past . . . ."[37]

A being experience is an experience of direct relationship between a person and that which would be an object if the mask field were operating. This direct relationship is without the operation of the mask field so that no classification, cataloging or matching of the data will occur. Linkage between the homeostat and the projection field is direct and awareness of that which was formally an object becomes complete. This relationship dissolves the loneliness which is a

product of mask field operation. It is not possible during such an experience to describe the event as the mask field which is responsible for motor response is not functioning.

Buber's description of the I-You experience: "The relation to the You is unmediated. Nothing conceptual intervenes between I and You, no prior knowledge and no imagination: and memory itself is changed as it plunges from particularity into wholeness." [38]

A caveat should be entered here: The world of the mask field is also the source of bodily support such as food, clothing, shelter, etc. While the being experience is unique and to be treasured the body will cause the mask field to begin operations so that drives may be satisfied.

CHAPTER VI

SUMMARY

This paper has discussed limits which preclude experience and how those limits may be overcome. The most important implication is that experience is limited by not having previously experienced some similar event. Even if similar events have been experienced the homeostatic process will act to protect the homeostatic situation. Actions of the homeostat severely limit the mask field operations and thus limit experience. Masks can be generated and the mask field can operate to adapt to the environment only if the homeostatic position permits adaptation.

Masks and the mask field may be novel language but the implication of this language is to reduce the judgmental approach that is often encountered in psychology. For each person must accept the situation of the momentary present: change is possible only as the present experience can be altered so that future experience will be different from present experience.

Language is vital. The child's chant "Sticks and stones may break my bones but names will never hurt me," is just that - the chant of a child. Language is more powerful than one may be willing

to concede. Language is not only the link between people but it is the primary shaper of masks. Masks are so shaped by language that debates are often prejudged by the choice of words used. Since experience is the result of mask field operations on data of the projection field it is only through the use of language that one is able to differentiate between data which originates internally and that which originates externally.

FOOTNOTES

[1]Alan Watts, Cloud Hidden: Whereabouts Unknown (New York: Vantage Books, 1974), pp. 118-122.

[2]Philip Handler, ed., Biology and the Future of Man (New York: Oxford University Press, 1970), p. 417.

[3]J. Bronowski, Science and Human Values (New York: Harper and Row, 1972), p. 14.

[4]R. L. Gregory, Concepts and Mechanisms of Perceptions (London: Gerald Duckworth and Co. Ltd., 1974), pp. 596-597.

[5]Ulric Neisser, "The Process of Vision," in Image Object and Illusion, Readings from Scientific American (San Francisco: W. H. Freeman and Company, 1971), p. 7.

[6]Ernst Cassirer, An Essay on Man (New Haven: Yale University Press, 1962), pp. 39-40.

[7]Isaac Asimov, Human Brain Its Capacities and Functions (New York: New American Library, 1963), pp. 260-261.

[8]Ibid., pp. 189-194.

[9]Nigel Calder, The Mind of Man (New York: Viking Press, 1970), pp. 47-50.

[10]Ibid., p. 59.

[11]Handler, op. cit., p. 369.

[12]Marilyn Ferguson, The Frontiers of Brain Research (New York: Bantam Books, 1975), p. 245.

[13]Ralph Norman Haber, "Eidetic Images," in Image Object and Illusion, Readings from Scientific American, op. cit., p. 125.

[14]Ibid., p. 127.

[15]Wilder Penfield, "The Permanent Record of the Stream of Consciousness," in Medical Behavioral Science, ed. by Theodore Millon (Philadelphia: W. B. Saunders Company, 1975), pp. 136-317.

[16]Gregory, op. cit., p. 596.

[17]Ibid., p. 598.

[18]Cassirer, op. cit., p. 25.

[19]Walter Percy, The Message in the Bottle (New York: Farrar, Strauss and Giroux, 1975), p. 44.

[20]William C. Dement, Some Must Watch While Some Must Sleep (San Francisco: W. H. Freeman and Company, 1974) p. 49.

[21]Ibid., p. 92.

[22]Nathaniel Kleitman, "Patterns of Dreaming," in Altered States of Awareness (San Francisco: W. H. Freeman and Company, 1972), p. 50.

[23]Michael Jouvett, "The States of Sleep," in Altered States of Awareness (San Francisco· W. H. Freeman and Company, 1972), p. 58.

[24]Dement, op. cit., p. 30.

[25]Ibid., p. 70.

[26]Jouvett, op. cit., pp. 57-58.

[27]Milton Kramer, "Paradoxical Sleep" in Medical Behavioral Science, ed. by Theodore Millon (Philadelphia: W. B. Saunders Company, 1975), p. 166.

[28]Woodburn Heron, "The Pathology of Boredom," in Altered States of Awareness (San Francisco: W. H. Freeman and Company, 1972), p. 64.

[29]Noam Chomsky, Language and Mind (New York: Harcourt Brace Javonovich Inc., 1972), pp. 88-91.

[30]Ibid., p. 90.

[31]Benjamin Lee Whorf, Language, Thought and Reality (Boston: M.I.T. Press, 1956), p. 212.

[32]Ibid., p. 42.

[33]Gregory, op. cit., p. 627.

[34]Ibid., pp. 627-628.

[35]Pierre Teilhard de Chardin, The Phenomenon of Man (New York: Harper and Row, 1959), p. 165.

[36]Martin Buber, I and Thou, trans. by Walter Kaufmann (New York: Charles Scribner's Sons, 1970), p. 54.

[37]Ibid., p. 63.

[38]Ibid., p. 62.

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